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Landowner and Practitioner Perspectives on Private Land Conservation Programs

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ABSTRACT

Efforts to reverse declines in native grasslands benefit from agricultural policies that encourage private land conservation. The U.S. Department of Agriculture's Conservation Reserve Program (CRP) improved conservation across landscapes but enrollment has declined. We used sequential exploratory mixed methods to compare landowner and conservation practitioners' perceptions, evaluate perceived benefits, and identify potential improvements to CRP. Focus groups of practitioners informed a quantitative survey of landowners who had properties >160 total acres in Nebraska. Results suggest potential misalignment in perceptions between practitioners and landowners. Practitioners were concerned that conservation, especially of wildlife, was secondary to profit. But the majority of landowners valued CRP-related ecosystem services, including native pollinators. Practitioners posited that younger landowners were primarily profit motivated, but CRP enrollment did not differ by demographics. Practitioners and landowners identified rule complexity as a major challenge and practitioner–landowner relationships as critical to success. Findings suggest that practitioners may underestimate non-economic motivations and illuminate opportunities to encourage private land conservation.

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Introduction

The ecological structure and function of mixed mosaic native grassland and farmland communities are increasingly threatened by the intensification of agricultural production (Samson and Knopf 1994). As a result, the status of wildlife populations in grasslands and farmlands worldwide is closely tied to agricultural policies and the local land management practices they support (Giudice and Haroldson 2007). Balancing economic and ecological goals on farmland is challenging, but the current extent of protected areas is insufficient to conserve grassland ecosystems (Knight 1999; Knight et al. 2010). Therefore, comprehensive conservation approaches must consider the potential for human-dominated landscapes to simultaneously maintain biodiversity and provide society's food and fiber needs.

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In the United States, the U.S. Department of Agriculture's Conservation Reserve Program (CRP) provides financial incentives that help landowners balance economic necessities with natural resource conservation. First introduced in the 1985 Federal Food Security Act, or Farm Bill, CRP is a part of a regularly reauthorized omnibus bill aimed at ensuring food security in the United States. CRP works by paying agricultural producers an annual payment to plant cropland to perennial cover for a period of 10–15 years. Initially intended to support stable commodity prices, reduce erosion, and improve water quality by retiring marginal farmlands, CRP is now widely heralded as among the most successful means of affecting agricultural policy for the betterment of wildlife (Allen and Vandever 2012). With an estimated 30–40 million acres enrolled annually (Barbarika et al. 2004), CRP has improved wildlife conservation efforts in the Great Plains and helped stabilize populations of many grassland dependent species (Herkert 2009).

Despite early conservation successes, CRP enrollment is declining. In Nebraska, for example, CRP enrollment peaked in 2007 with roughly 17,000 farms enrolling 1.3 million acres, but by 2012 enrollment had declined roughly 30% to 900,000 acres (USDA Conservation Reserve Program Statistics 2015). Much of the decline in CRP enrollment is attributed to higher commodity prices, as the area planted to corn over the same time period increased from 9.4 million to 9.9 million acres (USDA Crop Acreage Data 2015). However, non-economic factors, such as program bureaucracy and changes in farm demographics and agricultural practices may also be contributing to reduced participation in conservation programs like CRP (Siebert, Toogood, and Knierim 2006; Knowler and Bradshaw 2007). Although the complete loss of CRP participation is unlikely, dramatic reductions and changes in the distribution and land types covered in CRP are likely to have corresponding implications to soil, water, and wildlife resources of Nebraska.

Private lands' stewardship, including participation in CRP, is driven by numerous factors, particularly perceptions regarding costs and benefits of engaging in conservation (Newburn et al. 2005; Kreuter et al. 2006). Costs may include investment of time or resources. Benefits could come in the form of financial incentives or increased environmental quality. If landowners value sustainability of soil, water, and wildlife—either for production-related ecosystem services or more altruistic reasons—they are more likely to engage in stewardship (Arbuckle Jr 2013; but see González-Esquivel et al. 2015). Landowners can also be motivated by a sense of moral duty and other non-monetary incentives (Quartuch and Beckley 2013, 2014). If social norms (e.g., expectations of family, friends, and community members; Stern et al. 1999) or sense of place (Jorgensen and Stedman 2001) align with conservation goals, stewardship will have added benefits for the landowner (Lute and Gore 2014a; Larson, Cooper, and Hauber 2015). However, stewardship requires not only internal motivation but also institutional capacity, resources, knowledge, and funding to implement (Ostrom et al. 1999; Ostrom 2011). Therefore, income, education, and health are thought to be key indicators of landowner participation in conservation (Moon and Cocklin 2011). Ultimately private lands' stewardship relies on the relationship between local landowners and those with expert ecological knowledge (Willcox and Giuliano 2011; Willcox, Giuliano, and Monroe 2012). Relationships between landowners and local conservation practitioners (e.g., Pheasants Forever farm bill biologists, Nebraska Game and Parks Commission [NGPC] biologists, USDA Farm Service Agency and Natural Resource Conservation Service officials, Natural Resources District officials) are a key to exchanging knowledge, material resources, and institutional capital

needed for effective and coordinated conservation (Sjölander-Lindqvist 2008). Even for federal cost share programs like CRP, local conservation practitioners have significant responsibility in communicating with private landowners and facilitating participation in the program. Factors underlying enrollment decisions are complex, making it difficult for local practitioners to understand the best strategy for communicating with private landowners. Thus determining opportunities to improve facilitation of conservation participation requires understanding not only the underlying motivations behind landowner decisions, but also the corresponding perceptions of local conservation professionals (Kusmanoff et al. 2016).

To identify potential improvements to private land stewardship, we sought to explore perceptions related to conservation on private lands from the perspectives of landowners and conservation practitioners in the Conservation Reserve Program, using the State of Nebraska as an example. Perceptions such as perceived costs and benefits of CRP participation as well as alternative methods of conservation on private lands were explored. Specifically, we used a mixed method framework to 1) compare landowner motivations with conservation practitioners' perceptions about landowner motivations for participation in CRP and 2) gauge opportunities for alternatives to common and current CRP practices based on landowner responses. Enhanced understanding will help inform knowledge exchange, relationship building, and institutional trust needed for effective and coordinated private land conservation.

Methods

Data Collection

We used a sequential exploratory mixed method approach that qualitatively assessed conservation practitioners' perceptions of landowner motivations for participation in CRP followed by a quantitative assessment of landowner perceptions regarding private land conservation and cost share programs (Ivankova, Creswell, and Stick 2006). We used a sequential exploratory methodology because it facilitated first an exploration of themes in private land conservation unconstrained by a priori assumptions that was then quantified with the second research phase (Creswell and Clark 2007). The mixed method approach also ground the data in our case study context and allowed comparison of qualitative practitioner data with quantitative landowner data. We focused on these two groups because they are the key players in private land conservation in the study context. Conservation practitioners are responsible for promoting CRP programs and enrolling landowners. Therefore, their perceptions and assumptions, which frame their communication regarding CRP (e.g., rules, benefits) and interactions with landowners, potentially influence landowners' participation in private land conservation. We treated practitioners as key informants and used their experiences and perceptions to explore CRP-related issues (see Supplemental Info for interview guide). Focus groups provide an appropriate qualitative data collection method for such exploratory research that can then inform a more confirmatory quantitative method such as the mail survey of landowners we conducted in the second stage. We conducted eight focus groups to capture depth and breadth of their perspectives. Each focus group consisted of 6–9 practitioners from NGPC, USDA Farm Service Agency and Natural Resource Conservation Service, Natural Resources District, and Pheasants Forever. Furthermore, we compared the two groups to identify gaps between practitioner and landowner perspectives. We looked for misalignment about the

benefits and motivations of private land conservation to illuminate opportunities where improving communications could enhance participation.

First, we recorded focus group interviews following a semistructured interview protocol with Nebraska conservation practitioners to determine their perceptions of benefits and motivations related to CRP participation by landowners. We solicited practitioners from throughout Nebraska using directed e-mail correspondence to regional offices with focus groups occurring in each of the four management districts of NGPC between January and February 2014.

Second, we implemented a two-wave mail survey of Nebraska landowners with questions derived from information gained in the focus groups (following Dillman 2000). Using a regionally stratified method, we sampled proportionately among four regions in the state (northeast, northwest, southeast, and southwest). A stratified sample was necessary to encompass the variety of ecological conditions and thus associated agricultural practices and subsidy programs that exist across Nebraska. Moreover, many organizations apply conservation measures at the county or regional level, which requires information that is region specific. We identified a random sample of 13,187 unique owners of >160 acres of land in Nebraska who were older than 19 years from county land parcel data. The mail survey was designed in Snap Surveys (Snap Surveys Ltd., Bristol, UK) and sent to landowners in two waves starting with initial invitation letter in February 2015, followed by a postcard reminder 3 weeks later. The survey addressed 1) perceived benefits of CRP participation (i.e., in terms of wildlife, soil, and water resources) 2) motivations for participation, 3) current limitations to participation, and 4) value of alternative methods of conservation on private lands (elicited from conservation practitioners; see Supplemental Info for survey). Questions regarding CRP participation, other voluntary conservation practices, land ownership and tenure, information sources, and sociodemographics (i.e., age, education, ethnicity, gender, income, zip code) were measured with binomial and categorical response options. Questions about benefits and effectiveness of CRP practices (i.e., burning, disking, grazing, herbicide treatment, interseeding), motivations for past or present CRP participation, and support for changes to current CRP were measured with five-point Likert-type response options (e.g., strongly disagree–strongly agree, not at all important to very important).

Analysis

Qualitative focus group data were analyzed by the scan, order, compare, and review method, which is an iterative process that allows for exploration of themes that emerge from rich data (LeCompte and Goetz 1982). The process of analyzing voice-recorded focus group data occurred by: 1) an initial assessment to record repeated concepts and ideas (i.e., emergent themes), 2) a second assessment to order and compare themes in context and meaning across focus groups, 3) a third assessment to review accuracy of the final emergent themes and their similarities, differences, and importance across groups. Emergent themes from focus groups were used to guide development of the landowner survey and then structure comparisons between practitioners and landowners at the final stage of analysis. The qualitative stage of data analysis was exploratory and not intended to be representative, thus we present broad emergent themes to structure and compare with the quantitative results.

Quantitative survey data were analyzed with descriptive and non-parametric statistics in R (R Core Team 2015). We classified landowners into three groups: those currently

enrolled in CRP, those previously but no longer enrolled in CRP, and those who had never enrolled in CRP. To ensure independence among groups, we excluded landowners not definitively placed into one of the three enrollment groups (i.e., landowners who owned a combination of acres that were enrolled in the program and acres that had been removed from the program, or landowners who did not disclose their enrollment status on the survey).

Rather than analyzing each specific item in a given category, composite variables were created for items with sufficiently high scale reliability (Cronbach's $\alpha > 0.7$; Cronbach 1951). We created mean composite variables by averaging responses to CRP benefits ($\alpha = 0.88$) and CRP negatives ($\alpha = 0.87$; each ranged 1–5). We created a summative composite variable for conservation practices, with 0 indicating that a respondent engaged in no conservation practices (beyond CRP) and 11 indicating participation in 11 practices. We used Kruskal–Wallis tests to assess differences among enrollment groups (e.g., sociodemographics, CRP benefits, motivations for participation). The University of Nebraska-Lincoln Committee on Research Involving Human Subjects (IRB#20141114575EX) approved methods used in this research.

Results

We interviewed 29 practitioners as a part of the 8 focus groups. We identified five emergent themes from focus groups and addressed each one separately.

A total of 2,284 landowners responded to the mail survey (17% response rate), of which 1,950 were categorized into one of the three enrollment groups: currently enrolled (22% response rate), formerly enrolled (12% response rate), and never enrolled (9% response rate). Low response rate may indicate bias in our sample, but we were limited in our ability to account for non-response bias. The comparatively higher response rate among currently enrolled could have been a reflection of greater motivation among that group and interpretation of results should consider this potential bias. Forty-seven percent of respondents ($n = 1,080$) currently had land in CRP with an average category of 21–40 acres in CRP and 11–20 years of enrollment. The average total area category was 320–639 acres. Among our sample, 22% of landowners ($n = 506$) had never participated in CRP and 16% ($n = 364$) were formerly but not currently enrolled. Eleven percent ($n = 261$) of landowners had acres both enrolled in CRP and previously enrolled in CRP, and 3% ($n = 73$) did not disclose their enrollment status; because the enrollment status of these last two groups was less clear, we did not include their responses in subsequent analyses. Seventy-nine percent of landowner respondents were men and 61% were owner-operators (as opposed to renter-operators or absentee landowners). Respondents' average age was over 65 years old, education was a bachelor's degree and income was \$70,001–100,000/year. Thus, our sample was skewed toward older males, which generally reflects the landowner population demographics in our study area (U.S. Census 2010).

Emergent Theme 1: Financial Considerations Versus Conservation

Financial Considerations are Most Important and Wildlife Conservation is Secondary to Landowner Decisions about CRP Participation

Practitioners posited that landowners' main perceived benefit from CRP was short-term financial gains and that improvement to water, soil, or wildlife conservation on private land

was secondary to the bottom line. Focus groups indicated that increasing commodity prices might undermine enrollment in CRP, but enrollment could increase if, for example, corn price dropped. Conservation was seen as useful and important to landowners, but a competing consideration for farmers barely making a profit, balancing changing commodity prices and many other challenges. Practitioners felt that landowners enjoy “seeing the critters” and want pheasants to hunt but are not motivated to increase biodiversity and viewed other wildlife as competition for natural resources on their land.

Quantitative Landowner Survey Responses

To compare practitioner and landowner perceptions, we surveyed landowners about their perceived positives and negatives of CRP and the factors influencing their choices to enroll or not enroll in CRP (Supplemental Table 1). Survey respondents ranked ecosystem services provided by CRP land as the most important: reducing erosion, providing habitat for pheasants and quail, decreasing water runoff, providing better quality soil for the future, and improving water quality were the five most listed benefits of CRP (i.e., mean agreement >4). The three most listed negatives of CRP (i.e., mean agreement >3) were that CRP land 1) creates weed problems on their own CRP land and 2) adjacent lands, and 3) landowners receive more pressure to allow hunting. Other concerns such as predators, insects, and esthetics were not highly ranked concerns. Respondents rated wildlife habitat, concern for soil erosion, and quality of land as the highest factors that determined their enrollment in CRP (i.e., mean agreement >4; Supplemental Table 2). Respondents showed moderate agreement with economic incentives, such as guaranteed payments and the perception that CRP is a profitable use of land, as influences on their enrollment decisions. One economic factor (i.e., crop production more profitable than CRP) was ranked highly among reasons not to enroll in CRP (mean agreement >3). We also asked landowners about their desired goals of CRP management. The highest rated goal was to create better wildlife habitat, followed by creating more diverse grass and forb stands, and increase future forage production for livestock.

Because practitioners discussed the importance of hunting in motivating CRP management, we asked landowners about their and others’ hunting activities on the landowners’ land. Fifty-five percent of landowners identified as hunters with 96% of those indicating that they hunt their own land. Of the 45% of landowners who did not identify as hunters, 76% stated that they still allow hunting on their property.

To explore whether practitioners’ emphasis on financial considerations corresponded to the perceptions of a particular type of landowner, we tested whether enrollment groups differed in their perceptions regarding CRP benefits, negatives, reasons for and against enrolling, and goals of CRP management. Non-enrolled landowners were more likely than enrolled landowners to say that potential for crop prices to increase before CRP contract expired (Kruskal–Wallis $\chi^2 = 10.28$, $P < 0.01$) and that crop insurance reduced risk associated with farming (Kruskal–Wallis $\chi^2 = 21.00$, $P < 0.001$) were important reasons for not enrolling.

Emergent Theme 2: Age

Older Landowners are More Motivated to Participate in CRP Than Younger Landowners

Conservation practitioners from our focus groups were concerned that changing rural populations may lead to turnover in CRP enrollment. Practitioners believed most current

enrollees to be 60+ years old or absentee/recreational landowners. Focus group participants posited that older landowners are more likely to have experienced difficult times and unfavorable environmental conditions, which they hypothesized would motivate long-term soil and water conservation activities. Practitioners also discussed differences in perceived benefits among different types of landowners. Practitioners considered older, recreational-focused, and absentee landowners as more conservation minded or better able to invest in conservation practices than younger landowners focused on farming.

Quantitative Landowner Survey Responses

To quantify landowner participation in conservation, we asked about CRP participation as well as other conservation practices. Seventy-five percent of surveyed landowners had enrolled acres in CRP either in the past or present. Ninety-four percent reported conducting conservation practices that were not supported by financial assistance from the government. The most common practices among all landowners who conducted conservation practices (outside of CRP) were no-till farming (66%), invasive tree removal (62%), wind-break installation (50%), and leaving fence rows intact (48%). The summative composite score of additional conservation practices landowners conducted differed by enrollment group (Kruskal–Wallis $\chi^2 = 11.99$, $P < 0.01$), with landowners who had never been enrolled in the program listing on average fewer practices than the other two groups (Enrolled: 4.52 ± 2.13 , Prior: 4.33 ± 2.02 , Never: 4.07 ± 1.96). Ninety-five percent of landowners agreed that they were conservation minded.

To assess the practitioner perception that older landowners predominately participated in CRP, we tested sociodemographic differences in enrollment groups. There were no significant differences among enrollment groups in age (Kruskal–Wallis $\chi^2 = 4.26$, $P = 0.12$), gender (Kruskal–Wallis $\chi^2 = 1.52$, $P = 0.47$), education (Kruskal–Wallis $\chi^2 = 0.60$, $P = 0.74$), income (Kruskal–Wallis $\chi^2 = 0.20$, $df = 2$, $P = 0.91$), acres owned (Kruskal–Wallis $\chi^2 = 2.05$, $P = 0.36$), or region (Kruskal–Wallis $\chi^2 = 5.81$, $P = 0.05$). Composite variables calculated as a mean response to all questions within a category (i.e., benefits or negatives) confirmed that there were no differences among age classes in how highly they rated the importance of CRP benefits (Kruskal–Wallis $\chi^2 = 0.47$, $P = 0.79$) or negatives (Kruskal–Wallis $\chi^2 = 5.08$, $P = 0.08$). Because almost all landowners agreed that they were conservation minded and we received less than 18% of survey responses from absentee landowners, we were not able to examine perspectives specific to absentee landowners or conservation motivations as discussed by practitioners.

Emergent Theme 3: Landowner Norms

Current Norms Discourage Conservation

Focus groups discussed the role of peer pressure in influencing perceptions and motivations to conduct conservation practices on private land. Practitioners believed that the social norms of farming communities encourage traditional farming practices (i.e., practices that do not incorporate modern conservation considerations), particularly weed management, and discourage others from enrolling land in CRP.

Quantitative Landowner Survey Responses

To explore the role of social norms in the CRP participation, we asked landowners about peer pressure and others' opinions and participation in CRP. Most respondents did not

agree that peer pressure influenced their decisions to enroll (Supplemental Table 2) and that “neighbors have a bad perception of CRP” was a concern (Supplemental Table 1). Only 16% ($n = 359$) of respondents reported that family, friends, or neighbors were a source of pressure to not enroll in CRP. Echoing practitioner statements about weed management, noxious weed concerns were the highest rated negative of CRP.

However, enrollment groups differed significantly in whether they reported having friends or family enrolled in the program: 56% of landowners currently enrolled in the program reported having family/friends who were also enrolled, while 41% of previously enrolled landowners and 33% of never enrolled landowners had family/friends enrolled in CRP (Kruskal–Wallis $\chi^2 = 78.64$, $P < 0.001$).

Emergent Theme 4: Complexity and Flexibility

CRP is Too Complex and Inflexible for Landowners

Focus groups considered that the biggest limitation affecting landowner enrollment in CRP was the program’s inflexibility. They thought the program-made compliance difficult because it was inflexible, rules were too many and too stringent, and paperwork was burdensome for landowners.

Quantitative Landowner Survey Responses

After choosing crop production over CRP, the second ranked reason for not enrolling in CRP was the plethora of rules (Supplemental Table 3). Greater cost share, higher soil rental rates and simpler rules were the top ranked potential changes to CRP programs (Supplemental Table 3).

Respondents who were never or no longer enrolled in the program were more likely to agree that they did not enroll in CRP because there were too many rules (Kruskal–Wallis $\chi^2 = 77.83$, $df = 2$, $P < 0.001$). Enrollment groups also differed in their support of changes to contract length (Kruskal–Wallis $\chi^2 = 22.89$, $P < 0.001$): currently enrolled landowners were less likely to support shorter contracts of 3–5 years (mean agreement = 3.08 ± 1.17), but reducing contract length was popular among formerly enrolled landowners (mean agreement = 3.67 ± 1.01 ; Supplemental Table 3).

Emergent Theme 5: Relationships

CRP Participation Depends on Good Relationships Between Conservation Practitioners and Landowners

Practitioners credited positive interactions and strong relationships between practitioners and landowners as a major determinant of CRP enrollment. Discussions along this theme were often specifically linked to CRP enrollment; the process was thought to be unnecessarily complex (as discussed in Theme 4) and thus required practitioners to spend significant time guiding landowners through enrollment and mid-contract management. Regardless of complexity, personal relationships were seen as fostering new and continued participation in conservation through shared understanding of local landscapes and knowledge exchange.

Quantitative Landowner Survey Responses

We explored landowner perceptions of relationships based on who they turned to as trusted information sources. Landowner respondents indicated that three conservation

agencies were the most common sources of information about CRP enrollment: Farm Service Agency (62%), Natural Resources Conservation Service (44%), and Natural Resources District (34%; Supplemental Table 4). Two of those same conservation agencies were the most common sources of information about management generally: Farm Service Agency (36%) and Natural Resources Conservation Service (36%). Moreover, the majority (63%) of landowners who had conducted mid-contract management (e.g., burning or interseeding to establish plants before contract completion) on their land indicated that they chose a prescribed management plan based on what had been recommended by a conservation professional at a management agency.

Enrollment groups differed significantly in the distribution of sources from where they indicated they received information about CRP enrollment (Kruskal–Wallis $\chi^2 = 19.36$, $P < 0.001$; Supplemental Table 4). Majorities of enrolled landowners received information about CRP from USDA agencies (i.e., Farm Service Agency and Natural Resources Conservation Service). Never enrolled landowners reported family/friends/neighbors and university extension as information sources at greater rates than enrolled landowners.

Discussion

Our first objective was to compare landowner motivations and practitioner perceptions within the context of a private land conservation program in Nebraska. Results suggest that there may be some misalignment in the perceptions of practitioners and the stated motivations of private landowners in our study context. However, practitioners and landowners appeared to agree on themes regarding program complexity and the importance of practitioner–landowner relationships.

Similar to research on private land conservation in other states in the United States, landowners report diverse perceived benefits and motivations for participating in conservation, beyond financial considerations and social norms (Willcox and Giuliano 2011). While practitioners posited that financial considerations and production-related ecosystem services (e.g., soil and water conservation) predominantly motivated landowners (Kreuter et al. 2006), the majority of landowners valued CRP-related ecosystem services broadly, including conservation of soil and water as well as native pollinators. Practitioners correctly perceived that landowners value hunting opportunities. Over half of the surveyed landowners were hunters, most of whom hunt on their own land, which is consistent with the importance of providing wildlife habitat in enrollment decisions, and habitat for pheasants and quail specifically as a benefit of CRP.

Although financial considerations were not explicitly ranked high in stated landowner priorities, they should not be dismissed as unimportant in decision-making about private land conservation. CRP enrollment is generally correlated with crop prices (Conservation Reserve Program Statistics 2015); therefore, practitioners are correct that financial considerations relevant to agricultural operations are important in enrollment decisions. However, landowners in our sample consistently ranked other less direct or explicitly non-financial benefits of CRP highly, suggesting that communication aimed at encouraging CRP enrollment should emphasize the many benefits of CRP, including ecosystem services and wildlife conservation. Self-perception theory posits that people are motivated to behave consistently with their own and others' perceptions (Bem 1967; Whitmarsh and O'Neill 2014). In this way, communication that matches landowner perceptions of themselves as

balanced community members that value conservation for a myriad of reasons and contribute to broader socioecological communities may reinforce proconservation behaviors such as CRP enrollment.

Quantitative results show consistently strong norms in support of conservation practices and similar CRP enrollment across age groups, thus providing little support for practitioner perceptions that younger age and prevailing norms discourage conservation. These results may point to shifting conservation ethics and increasing proenvironmental attitudes among diverse demographics, which have been documented in other recent contexts (Mitchell and Kimmel 2009; Lute and Gore 2014a). Norms of landowners regardless of their age may provide renewed motivation to participate in conservation on private lands (Schwartz 1968; Price, Walker, and Boschetti 2014; Segan et al. 2015). It is important to note that strong conservation norms in our sample may reflect a bias among currently enrolled landowners. Further research targeting landowners who have never been enrolled in CRP (constituting 22% of this sample) could be conducted to identify barriers among landowners presumably less motivated to conserve. Still, while norms and sociodemographics may not explain declining CRP enrollment, we did find significantly more enrolled landowners with friends or family also enrolled in the program than in the other two groups. Without more empirical evidence concerning the effects of social norms on conservation actions among landowners, it is difficult to draw conclusions. However, our data do suggest that regardless of their actions, landowners clearly consider themselves independent agents who make decisions without influence from neighbors, friends, or family (see results from Theme 3), which may be important for practitioners to consider when communicating with landowners about enrollment in conservation programs.

While the reasons underlying declining CRP enrollment are complex and likely diverse, practitioners and landowners agreed logistical problems with the program may be inhibiting participation. With each successive renewal of the Farm Bill new rules and programs are added that affect CRP enrollment and management. While most changes are meant to improve the environmental benefits of CRP, changes also have the potential to create confusion for landowners and practitioners. To address the issues that may be contributing to declining private land conservation, our second objective was to gauge opportunities for alternatives to current practices (see results from Theme 4). Although we are limited in our ability to infer influences on enrollment decisions, our results (from Theme 1) suggest that wildlife habitat, concern for soil erosion and land quality improvement may be as, if not more, important for encouraging enrollment than direct economic incentives. Our results did indicate that economic considerations may be important disincentives for those who choose not to enroll in CRP. The distinction between economic incentives and disincentives may seem minor, but a nuanced understanding of each can help practitioners design changes or alternatives to current CRP and better target communication campaigns aimed at encouraging conservation participation. For instance, communication aimed at recruiting new CRP enrollees may be best if it emphasizes goals of soil, water, and wildlife conservation (i.e., the incentives identified here) and, later in reenrollment phases, mitigating financial disincentives such as incorporating flexibility in cost share to address changing commodity prices.

Practitioners and landowners agreed that simplifying rules and increasing flexibility (e.g., contract length, mid-contract management) would be a welcome change to the current CRP program. Flexibility may be especially important in systems with diverse

landowners (e.g., production vs absentee landowners; Moon and Cocklin 2011; Petrzelka, Malin, and Gentry 2012; Petrzelka, Ma, and Malin 2013). In our survey of landowners, we found that while simplifying the program was a popular suggestion among landowners regardless of enrollment history, enrollment groups differed in some of the other suggested changes, specifically their support for 3–5 year contracts. Currently enrolled landowners were less supportive of shorter contracts than previously enrolled landowners, suggesting that while incorporating flexibility into signing options may be beneficial for some landowners, allowing others the option for longer contracts may be one way to reduce burdensome paperwork in the future. Changing rules such as contract length and increasing flexibility needs to be measured against conservation outcomes (Newburn et al. 2005). Changes that encourage conservation of high-quality land and do not increase vulnerability through future land use change may have benefits over changes that waste resources enrolling land that will be subsequently removed or will not serve conservation goals in short or long terms. It is also worth noting that landowners in general were more supportive of higher incentives for mid-contract management than they were for less required management (although they were not supportive of more required management, even with greater incentives). Combined with the results that landowners conduct conservation activities on their land without government assistance, our results suggest that logistical changes to conservation programs may well facilitate conservation practices landowners are already motivated to do.

Practitioner–landowner relationships were important to both parties. Practitioners were trusted sources of information and influenced the actions landowners took on private lands. In some of the most challenging natural resource issues, institutional trust prevents building shared knowledge and cooperation in decision-making (Farrell 2010; Butler 2011). In the context of Nebraska CRP, our results do not suggest mistrust of the management agency. Yet, practitioners were concerned about building consistently positive and proactive relationships with landowners, which may be critical to recruiting and retaining landowners in private land conservation (Willcox and Giuliano 2011). While increased flexibility and decreased complexity may simplify program logistics and be an important step in encouraging CRP enrollment, relationships that facilitate exchange of knowledge may be an equally important component to effectively conserve habitat, soil, and water on private lands (Vaske et al. 2004; Brewer and Ley 2013). Knowledge exchange is important for technical reasons (i.e., understanding best practices ensures efficacy of invested resources) as well as non-technical aspects of conservation (Berkes 2009; Lute and Gore 2014b). Place-based knowledge roots broader understanding in context (Smith et al. 2011). Two-way exchange between local and “expert” knowledge-holders encourages trust and cooperation (Cash et al. 2002; Ingram 2008). Private land management is highly personal for multigenerational farming families and landowners with a strong sense of place. Trust and two-way knowledge exchange are therefore critical for encouraging cooperative conservation in such contexts (Hoffman, Lubell, and Hillis 2014; Watts and Scales 2015). Good working relationships mean that practitioners can effectively recognize and address landowner concerns, such as weed management, to encourage private land conservation.

Our results suggest that CRP and private land conservation programs in similar contexts may be best improved by introducing more contract flexibility and rule simplicity that allows relationships between practitioners and landowners to flourish. Programs aimed at regulating or incentivizing endangered species conservation on private land, for

example, may benefit from similar emphases on relationships, flexibility, and simplicity. These three aspects may be particularly important for overcoming concerns typically associated with rural landowners, namely, mistrust of top-down government and dislike of strict regulations that limit property rights. Our results also suggest that the logistical problems with CRP may be interfering with already existent conservation norms. Although the current regulation structure of CRP was created to meet specific conservation objectives, effectively leveraging proconservation attitudes in a simplified program may do more in the end to reach conservation goals. There are trade-offs in easing certain rules, but maintaining communicative relationships between practitioners and landowners is a key for allowing CRP to persist in a changing economic climate. Modifying the CRP enrollment process to allow practitioners and landowners to create individualized conservation plans that are appropriate and effective for the particular place and landowner could provide flexibility the program needs to persist in the future (Lindsay 2016). This process of shared learning and decision-making between practitioners and landowners can lead to greater satisfaction and continued institutional trust that ensures future reenrollment and sustained conservation on private lands.

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Supplemental Table 1. Landowner opinions on CRP benefits and negatives (February 2015).

Please rate the importance of the following benefits of CRP to you. 1-5 (Not at all to very important)	Enrollment Group Quantitative Results (mean \pm sd)						Relevant Focus Group Theme
	Enroll	Prior	Never	n	Kruskal-Wallis (KW) χ^2	p	
Reduce erosion	4.30 \pm 0.84	4.17 \pm 0.84	4.18 \pm 0.83	1806	15.77	<0.001	<i>1 Financial considerations are most important and wildlife conservation is secondary to landowner decisions about CRP participation.</i>
Provide habitat for pheasants and quail	4.30 \pm 0.88	4.01 \pm 0.96	3.86 \pm 1.06	1804	75.32	<0.001	
Decrease water runoff	4.19 \pm 0.88	4.03 \pm 0.95	4.07 \pm 0.86	1801	14.68	<0.001	
Provide better soil for the future	4.14 \pm 0.88	4.04 \pm 0.87	4.08 \pm 0.82	1796	6.02	<0.05	
Improve water quality	3.99 \pm 0.97	3.85 \pm 0.99	3.93 \pm 0.97	1779	6.20	<0.05	
Reduce the impact of drought	3.81 \pm 1.02	3.67 \pm 1.01	3.74 \pm 1.03	1792	5.05	0.08	
Restore diverse native prairies	3.83 \pm 1.06	3.55 \pm 1.10	3.58 \pm 1.07	1781	27.28	<0.001	
Provide hunting opportunities	3.78 \pm 1.23	3.47 \pm 1.21	3.32 \pm 1.27	1799	53.06	<0.001	
Increase pollinators	3.19 \pm 1.34	2.95 \pm 1.25	2.85 \pm 1.26	1782	25.76	<0.001	
Provide wildlife-viewing opportunities	3.67 \pm 1.25	3.28 \pm 1.28	3.19 \pm 1.28	1798	56.01	<0.001	
Provide places for recreation	3.19 \pm 1.34	2.95 \pm 1.25	2.85 \pm 1.26	1788	22.55	<0.001	
How much do you agree with the following negative effects of CRP to your land? 1-5 (Strongly disagree to agree)	Enroll	Prior	Never	n	KW χ^2	p	<i>3 Current norms discourage conservation.</i>
Invites noxious weeds	3.30 \pm 1.24	3.45 \pm 1.09	3.48 \pm 1.03	1892	10.06	<0.05	
Increased pressure to open access to hunting	2.93 \pm 1.14	3.15 \pm 1.11	3.32 \pm 1.08	1888	38.06	<0.001	
Source of weed seed for adjacent lands	2.91 \pm 1.12	3.23 \pm 1.13	3.37 \pm 1.05	1887	61.31	<0.001	
Harder to farm land in the future	2.58 \pm 1.06	2.82 \pm 1.13	2.93 \pm 1.07	1874	36.08	<0.001	
Harbors predators of livestock	2.52 \pm 1.00	2.79 \pm 1.00	3.00 \pm 1.04	1881	71.43	<0.001	
Harbors insects	2.58 \pm 1.03	2.68 \pm 0.96	2.95 \pm 1.02	1872	36.80	<0.001	
Neighbors have a bad perception of CRP	2.35 \pm 0.93	2.33 \pm 0.89	2.60 \pm 0.90	1878	27.29	<0.001	
Loss of aesthetics	2.24 \pm 0.92	2.51 \pm 0.88	2.67 \pm 0.97	1818	71.84	<0.001	

Reduces moisture for crops	2.16 ± 0.89	2.39 ± 0.89	2.56 ± 0.99	1871	57.75	<0.001	
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Supplemental Table 2. Landowner reasons to enroll or not to enroll in CRP.

Please rate the importance of the following factors in your decision to enroll. 1-5 (Not at all to very important)	Enrollment Group Quantitative Results (mean ± sd)						Relevant Focus Group Theme
	Enroll	Prior	Never	n	KW χ^2	p	
Provide wildlife habitat	4.33 ± 0.94	4.20 ± 0.92	4.02 ± 1.09	1780	57.59	<0.001	<i>1 Financial considerations are most important and wildlife conservation is secondary to landowner decisions about CRP participation.</i>
Concern for soil erosion	4.10 ± 1.07	3.99 ± 0.97	4.11 ± 0.99	1773	8.47	<0.05	
Improve quality of land	4.03 ± 0.96	3.86 ± 0.97	3.95 ± 0.99	1763	10.28	<0.01	
Guaranteed payments	3.68 ± 1.11	3.72 ± 1.11	3.58 ± 1.12	1758	3.84	0.147	
Most profitable use of land	3.33 ± 1.20	3.58 ± 1.18	3.45 ± 1.16	1761	13.51	<0.01	
Meet conservation compliance	3.31 ± 1.22	3.18 ± 1.13	3.44 ± 1.10	1753	9.92	<0.01	
Increase financial stability	3.22 ± 1.20	3.37 ± 1.17	3.34 ± 1.13	1752	5.61	0.061	
Reduce farm labor	2.10 ± 1.24	2.14 ± 1.20	2.33 ± 1.12	1745	12.37	<0.01	
Peer pressure to enroll	1.56 ± 0.89	1.56 ± 0.85	1.73 ± 0.91	1745	15.69	<0.001	
Please rate the importance of the following factors in your decision NOT to enroll acres into CRP. 1-5 (Not at all to very important)	Enroll	Prior	Never	n	KW χ^2	p	<i>3 Current norms discourage conservation.</i> <i>4 CRP is too complex and inflexible for landowners.</i>
	Enroll	Prior	Never	n	KW χ^2	p	
Crop production was more profitable	3.24 ± 1.45	3.58 ± 1.37	3.86 ± 1.18	1780	58.62	<0.001	
Too many rules with programs	2.82 ± 1.38	3.54 ± 1.41	3.25 ± 1.30	1765	77.83	<0.001	
Haying or grazing was more profitable	2.68 ± 1.40	3.10 ± 1.36	3.43 ± 1.28	1772	89.43	<0.001	
Potential for increased crop prices before CRP contract expired	2.63 ± 1.33	3.01 ± 1.35	3.04 ± 1.23	1756	36.85	<0.001	
Do not like government programs	2.46 ± 1.23	2.99 ± 1.33	2.93 ± 1.26	1756	62.44	<0.001	
Need crops for livestock feed	2.38 ± 1.45	2.75 ± 1.40	3.23 ± 1.43	1774	100.77	<0.001	
Crop insurance reduced my risk associated with farming	2.41 ± 1.25	2.55 ± 1.23	3.00 ± 1.24	1756	65.23	<0.001	
Needed to keep family member or tenant in farming	2.14 ± 1.29	2.46 ± 1.36	2.87 ± 1.42	1773	84.78	<0.001	

Peer pressure to NOT enroll	1.55 ± 0.84	1.66 ± 0.94	1.76 ± 0.91	1755	18.96	<0.001	
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Supplemental Table 3. Landowner opinion on CRP improvements.

What is your opinion of the following potential changes to private land cost-share programs in Nebraska? 1-5 (Not at all to very supportive)	Enrollment Group Quantitative Results (mean ± sd)						Relevant Focus Group Theme
	Enroll	Prior	Never	n	KW χ^2	p	
Simpler rules	3.87 ± 0.90	3.96 ± 0.99	3.97 ± 0.88	1753	6.17	<0.05	<i>4 CRP is too complex and inflexible for landowners.</i>
Higher soil rental rates	3.89 ± 0.91	3.81 ± 0.98	3.61 ± 0.97	1746	26.44	<0.001	
Greater cost-share for management	3.88 ± 0.89	3.71 ± 0.96	3.60 ± 0.95	1753	28.99	<0.001	
Less required management	3.28 ± 1.03	3.51 ± 0.95	3.45 ± 0.97	1734	16.18	<0.001	
Shorter contracts (3-5 years)	3.08 ± 1.17	3.67 ± 1.01	3.63 ± 0.88	1738	108.04	<0.001	
More required management at greater cost-share	2.97 ± 1.03	2.89 ± 1.03	3.01 ± 1.05	1720	2.76	0.25	

Supplemental Table 4. Sources of CRP information (percentage by landowner group).

Where do you get information about CRP (select all that apply)?	% Enroll (n= 1036)	% Prior (n= 341)	% Never (n= 339)	Relevant Focus Group Theme
USDA FSA	71.33	69.79	67.85	<i>5 CRP participation depends on good relationship between conservation practitioner and landowners.</i>
USDA NRCS	52.51	43.40	46.61	
Natural Resources District	40.83	30.79	43.36	
Family, Friends, Neighbors	32.53	30.79	45.72	
Pheasants Forever	22.59	14.37	16.81	
Nebraska Game and Parks Commission	14.58	9.97	20.94	
University Extension	9.94	13.49	24.10	
Farm Bureau	4.44	8.21	8.85	
Farmers Associations	3.57	6.16	6.19	
Internet searches	3.57	2.35	8.85	
Farm Businesses (seed/equipment dealers)	3.09	3.81	2.95	
Field Days	2.41	2.05	1.77	
Other	2.32	4.11	2.65	
Social Media (Twitter, Facebook)	1.16	0.29	1.77	